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# A Review on Nyctanthes arbortristis

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**ABSTRACT:**
Nyctanthes arbortristis linn is a well known traditional plants used throughout the India has a herbal remedy for treating various infectious and non infectious disease.Nyctanthes arbortristis linn is commonly known as night jasmine or parijat. The plant is a member of oleacea family. The shrub is naturally found in the tropical and sub-tropical regions of the world .Nyctanthes arbortristis is a medicinal plant found in India, south Asia and southeast Asia . It was revealed that this herbal plant exhibit various pharmacological activities because of the presence of glycoside and phenol compounds. Different pharmacological activities like hepatoprotective , antileishmanial, antipyretic, activities have been reported **.**

**KEYWORDS :** Nyctanthes arbortristis L, Phytochemical, Pharmacological, Review.

## INTRODUCTION:

Plants are the natural synthesizes that play a vital role in meeting the daily needs of the mankind. Nyctanthes arbortristis is also called as the tree of sorrow because the flowers lose their brightness during day time[(1)].The scientific name arbor-tristis also means "sad tree. "The flowers can be used as a sources of yellow day for clothing[(2)].In the present age of pharmaceuticals various chemical has been employed for effective management of disease. The nature has provided the storehouse of remedies to cure all ailments of mankind[(3)].Nyctanthes arbortristis is a large shrub or a small tree widely cultivated in tropical and sub tropical regions all over the world. Leaves ,fruits, flowers, stems and barks have pharmacological activity. Nyctanthes arbortristis is found growing in the loamy soils on the rocky terrain in the dryfoot hills and as under growth in dry deciduous forests in its native habitat. Nyctanthes arbortristis it has been utilized in folk medicine for antibilious, gynaecological problems, and hepatoprotective action. Nyctanthes arbortristis is a native of India flourishing wild in sub Himalayan region ranges from the Nepal,Assay,Bengal,Rajasthan,Madhya pradesh and southards to Godavari[(4)].Nyctanthes arbortristis have been screened for Anti malarial activity, Anti histamine activity,Anti ulcer activity,Anti hypnotic activity,Anti pyretic activity,Anti depressant activity,Anti cancer activity, Anti allergic activity,Anti allergic activity,Anti viral activity,Anti diuretic activity and CNS modulators[(5)].

**TAXONOMICAL CLASSIFICATION :[(2)]**
**KINGDOM** : planate
**DIVISION** : Magnolophyta
**CLASS** : Magnolopsida
**ORDER** : Lamiales
**FAMILY** : Oleacae
**GENUS** : Nyctanthes
**SPECIES** : arbor tristis
**BINOMIAL NAME** : Nyctanthes arbortristis
**LANGUAGE:[(4)]**
The plant is known by the following names in the languages mentioned against

**SANKRIT** :Parijatha
**ENGLISH** :Night jasmine
**MALAYALAM** :Parijatakan
**HINDI** :Harsingar
**TELUGU** :Pagadamelle
**KANNADA** :Parijatha

**DESCRIPTION OF PLANT:**

Nyctanthes arbortristis linn is a large shrub growing to 10m tall, with flaky grey bark, stiff whitish hair, young branches and round leaves. The leaves are 2-6.5cm broad with an entire margin the fruit is a flat brown heart -shaped to round capsule 2cm diameter with two section each containing a single seed[(2)]. It has fragrant flowers with 5-8 lobes which are white in color and corolla is orange coloured centrically they are produced in clusters of two to seven together with individual

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flowers opening at dusk and finshing at dawn [7].This tree grows well in a wide variety of loamy soil and in soil found in average garden situation with PH 5.6 to 7.5. It is a terrestrial woody perennial having span of 5-20 years[10].

**PHYTOCHEMICAL PROPERTIES:**

**LEAVES :**

The new benzoic esters of loganin namely arborside A,B,and C are found to be present in the leaves[5] .A phenyl propanoid glucoside desrhamosylverbascoside was reported from the leaves also contains alkaloid,nyctanthine along with amyrin and hentracontane[6].

**STEM :**

A glycoside narigenin-4-0-beta-glucopyranosyl -alpha-xylopyranoside was screened from the stem chromatographed the chloroform extract of the stem over silicagel column and reported the presence of beta amyrin,oleanolic acid nyctoside-A[10].

**SEEDS :**

Seeds give water soluble polysaccharides contain glucose and D-mannose indicates that the polysaccharide is a glucomannan[5].

**FLOWERS :**

Flowers contain modified diterpenoid nyctanthin, flavonoids and an essential oil which is similar to that of jasmine. It was also reported that hallerialucida cornus contro versa .It was found that after several months the compound arborside-c has changed to the isomeric structure with the benzoate group shifted to c-6-OH (10). Ethanolic extract from the flowers led to the isolationofanantiplasmodial,cyclohexyiethanoid,6-o-trans-cinnamolyl-7-0-acetyl-6- beta-hydroxyloganin (5).

**ROOTS :**

The root part of the plant composed of alkaloids,tanins and glucosides from the chloroform extract of the root beta-sitosterol and olenanolic acid has been isolated[10].

**PHARMACOLOGICAL ACTIVITY:**

**ANTIDIABETIC ACTIVITY :**

In a study the ethanol extract of Nyctanthes arbortristis stem and bark where found to have dose dependent antidabetic properties. In serum, the cholesterol and triglyceride level were higher in diabetic rats, but they were significantly decreased after treatment with Nyctanthes arbortristis stem and bark extracts. It was discovered that the stem and bark extract were more effective due to their hypolipidemic effect[1].Administration of Nyctanthes arbortristis leaves and flower chloroform extract (50,100 and 200mg/kg) orally for 27 days caused a significants reduction in LPO,SGOT,A1K PHOS, cholesterol and triglyceride levels on extract treated STZ diabetic rat, compared to diabetic control rat[7].Furthermore, when compared to diabetic rat that have been treated with NAT extract have shown a substantial increase superoxide dismutase (son)and catalase (CAT)enzymatic antioxidant activity[8].

The antidiabetic activity of methanol extract of root Nyctanthes arbortristis leaves comparable to that of diabetic control animals, the extract poses safe and strong anti diabetic activity. The extract was prepared by extracting 50g root powders with 400 ml of methanol for 18 hours by hot continuous extraction method. The methanolic extract was filtered and partitioned by using petroleum ether to remove impurities. The solvent was evaporated under press and dried in a vacuum. The dried extract of Nyctanthes arbortristis thus obtained was used for the assessment hypoglycemic acticity.It reduces blood glucose level after 7 days at the 500 mg/kg in rats compare with standard drug. It was found that ,methanolic extract of Nyctanthes arbortristis roots were more effective in reducing the blood glucose level compare to the standard drug[10].When diabetic rats treated with streptozotocin nicotinamide were given an ethanol extract of the stem bark, it demonstrated significant anti diabetic activity. The extract lowers blood glucose level dose dependently. [10]

**ANTIMICROBIAL ACTIVITY:**

The frequency of life threatening infection caused by pathogenic micro-organism. It has become a significant source of mortality and morbidity in immuno-compromised patients in underdeveloped nation with the growing resistance of infectious bacteria towards various synthetics medication[1].A study was conducted and it was reported that the stem bark extract of the plant were capable to exhibit in vitro antimicrobial activity by cup plate method. The test organism were staphylococcus aureus,Micrococcus luteus ,Bacillus subtilis ,Escherichiacoli,pseudomonus aeruginosa,candida albicans and Aspergillus nigar.The zone of inhibition and minimum

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inhibitory concentration (MIC) of the extract were ascertained and compared with the standard drugs ciprofloxacin and fluconazole[7] . Nyctanthes arbortristis oil from the leaves ,seeds and bark possesses a wide spectrum of an bacterial action against gram negative and gram positive micro organism including streptomycin strains .The stem bark extract ofthe their invitro antimcrobial activity against stephylococcus,aureus ,micrococcus tuteus ,bacillus subtilis ,Escherichia coli,psedomonas aeroginosa,candida albicans and aspergillus Niger.[20]

**ANTIBACTERIAL ACTIVITY:**

Infectious disease are world's leading cause of premature death. Resistance to antimicrobial agent is conferring in a wide variety of pathogen and multiple drug resistance is becoming common in diverse organisms such Staphylococcus aureus, Staphylococcus epidermis, Salmonella typhi,Salmonella paratyphi[7]. Methanolic and aqueous extract of the NTA leaves were investigated for in-vitro bactericidal activities against staphylococcus aureus,bacillus subtillus ,E.coli,pseudomonas auroginosa by disk diffusion method. Both bacteria extract active against bacteria except for pseudomonas auroginosa which was resistants to the aqueous extract[3].The zone of inhibition and Minimum inhibitory concentration(MIC) of the extract were determined and compared with the standard drug ciprofloxacin and fluconazole .The chloroform extract was found to have both Antibacterial and Antifungal activity whereas the petroleum ether and ethanol extract hold only antibacterial activity[10].

**ANTHELMINTIC ACTIVITY:**

The anthelmintic activity of an ethanolic extract of fresh flowers and dried leaves, stems and bark of NAT was investigated using piperazine citrate as a reference [1].The Anthelmintic activity was studied on the basis of inhibition of contractile effect of acetylcholine by various dilution of this extract .It is shown that ethanolic extracts of seeds and flowers and more decisive anthelmintic action than bark and leaves but less than piperazine citrate[7].

**ANTICANCER ACTIVITY :**

Cancer being the biggest challenge of the modern word Nyctanthes arbortristis has been further investigated for cancer properties**.** In a study against the trible negative breast cancer cell line, the 1C50 values of the methanolic extract of the dried fruit of Nyctanthes arbortristis were calculated to be 9.72 g and 13.8g.It has further identified bioactive phytochemical including glycoside ,tannis,phenols and steroids which are suspected to be responsible for its anticancer action. The anticancer efficacy was tested on various human cancer including liver HepG2,lung A549,leukeamia-HL-60,breast -MCF-7,colon HCT- 116,prostate-PC-3,and cervix-hela cell line this is first reported on the isolation and identification of the lupane -type tripenoid,betulinic acid, which has been reported before and has shown to have substantial anti inflammatory,antiproliferative and antioxidant activities in vitro[8].In another study ,various solvent extract of dried flowers of Nyctanthes arbortristis were examined for the anticancer potential on five different tumor cell lines. Including Colorectal adinocarcinoma(colo205) Retinoblastoma(Y79) chronic mylogenous leukemia(K562) Breast drug,Doxorubicin,as a positive control.Ethanol and ethyl acetic extract were found to be cytotoxic in a concentration dependent manner to the tested line cells out of which ethanol extract has been proven to be the most potent.Iridoid and carotinoid[10]

**ANTIOXIDANT ACTIVITY :**

Leaf extract of Nyctanthes arbortristis are extensively used in the Indian traditional medicine. The acetone soluble fraction of its ethyl acetate extract showed impressive antioxidant activity as related by several in-vitro experiment.eg,DPPH**(**1,1 diphenyl-2picryl hydroxyl), Hydroxyl and superoxide radicals, as well as $H_2O_2$ scavenging assays .Its preventive capacity against Fe(H)-induced lipid per oxidation of liposomes and gamma-ray induced DNA damage also confirmed there .The strong reducing powder and high phenol and flavonoid content could be responsible for this antioxidant activity (Antioxidant activity of Nyctanthes arbortristis leaf extract-Jithesh S.Rather shyann A.Hassarajani,subatra chattopadhyay).(5-1-2007).The different part of the flowers showed antioxidant activity. Whole flower, stalk and petals were used for the evaluation of antioxidant activity. The stem of the flower and petals when fresh aqueous extract of the flower and its parts were prepared .Dry extract showed double so activity than the fresh extract of the flowers, this is due to the presence of water content which lower the activity[15].Nyctanthes arbortristis revealed the presence of flavonoids, tannins ,saponins , glycoside, alkaloids, steroids and phenol

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compounds have been recognized as antioxidant agents, which act as free radical terminators photochemical screening of the ethanolic extract of the leaves and stems of aqueous and alcoholic extract of dried leaves of Nyctanthes arbortristis also have adequate antioxidant activity.The overall antioxidant activity of Nyctanthes arbortristis might be attributed to its polyphenolic content and other phytochemical constituents.

**ANTI ALLERGY ACTIVITY:**

The bark of the plant has also been checked for Anti-histamine activity. Petroleum ether,chloroform,ethyacetate,ethanolandaqueous extracts of Nyctanthes arbortristis bark were examined ,of which petroleum ether extract at 50 and 100 mg/kg showed maximum protection against mast cell degranulation by clonidine and resisted contraction (bronchodilation) induced by histamine at 50 and 100 mg/kg better than other extract which they proposed ,might be due to B sitosterol [(10)].The pretreatment of guinea pigs exposed to histamine aerosol with a water soluble portion of the alcoholic extract of Nyctanthes arbortristis leaves offered significant protection against the development of asphyxia.arbortristoside A and arbortristoside C are present in N.arbortristis were reported be anti allergic[(13)].

**ANTI INFLAMMATORY ACTIVITY:**

The aqueous extract of the whole plant ,alcoholic extract of stem and seeds and water soluble portion of the alcoholic extract of leaves of Nyctanthes arbortristis were reported to have acute and sub acute ant inflammatory activity[(13)]. The acute anti-inflammatory activity is evaluated informating models using different phlogistic agents viz, carrageenan, formolin, histamine, 5hydroxytryptamine and hyaluronidise in the hind paw of rats in the sub acute model, N.arbortristis was found to check granulation tissue formation significantly in the granulomapouch and cotton pellet test. Nyctanthes arbortristis is also found to inhibit the inflammation produced by immunological methods that are freund's adjuvant artristis and purified tuberculin reaction[(10)].The leaves of the plants have been used by ayurvedic physician for arthritis and obstinate sciatica. The juice of its leaves in different from have been advocated for acute and chronic as well as intermittent fever. reported the presence of anti inflammatory activity in water soluble portion of an ethanol extract of the leaves of the plants using experimental models representing immunological and non immune inflammation.[(21)]

**ANTI MALARIAL ACTIVITY :**

A clinical study including 120 malaria patients was conducted .A fresh paste of medium sized five leaves of Nyctanthes arbortristis administered free time daily for seven days cured 92 of patients. The remaining 20 patients recovered within ten days. While the other 8 did not respond to treatment. The paste was well -tolerated and no severe side effect.[(21)]

**REFERENCES :**

[1]. Santhi Latha Pandrangi et al., Therapeutic potential of Nyctanthes arbortristis on cancer and various diseases, "Annals of the Romanian Society for Cell Biology",Vol.26,issue 1,2022.
[2]. Jadhav santosh,Patil Manojkumar,A review on :Nyctanthes arbortristis Linn. Rejuvinating herbs, IJPSR, vol-1,issue1 **:**March 2016
[3]. Abhishek kumar sah and Vinod kumar vena ,Phytochemical and Pharmacological Potential of Nyctanthes arbortristis : A Comprehensive Review**,** IJPBMS**,**Vol-3, Jan-Mar2012,issue 1.
[4]. D. Sasmal,Sanjita Das and S.P. Basu , Phytoconstituents and therapeutic Potential of Nyctanthes arbortristis Linn, PHCOG REV, Vol 1,issue 2, Jul-dec,2007.
[5]. Madhuri Kumari et al., A Review on Nyctanthes arbortristis, ,WJPR, Vol-7, issue7, 429-435.
[6]. Milind M. Meshram et al., Nyctanthes arbortristis a Herbal Panacea , IJPSR ,Vol.3, issue08, April 2012.
[7]. Pushpendra Kumar Jain, Arti pandey, The Wonder of Ayurvedic medicine - Nyctanthes arbortristis, IJHM, June , vol-4,Issue 4,March 2016.
[8]. Hetal Bhalakiya, Nainesh R.Modi, Traditional Medicine Uses , Phytochemical Properties and Pharmacological Activities of Nyctanthes arbortristis , RJLBPCS ,2019.
[9]. Padma S.Vanker, Antioxidant Activity of Flower of Nyctanthes arbortristis, Indian Institute of Technology,IJFE,vol-4,Issue 8,2008.
[10]. Reema srivastava et al., Nyctanthes arbortristis A wonder Indian herbal drug need health care, BJSTR, vol-5,Issue

3,2018.

[11]. Jasper Sigh et al., Nyctanthes arbortristis a comprehensive review , WJCMPR,vol-3,Issue 4,2021.

[12]. Anowar hussain and Anand ramtake , Flower extract of nyctanthes arbortristis modulates glutathione level in hydrogen peroxide treated lymphocytes PHARMACOGNOSY RESEARCH,vol-4,Issue 4,2012.

[13]. Mansi solanki et al, Nyctanthes arbortristis and short review ,WJPPS,vol 10, issue 3, 1047-1054.

[14]. Champa rani et al, Nyctanthes arbortristis linn (N J) a sacred ornamental plant with immune medicinal potentials,NISCPR, vol-3, July 2012.

[15]. Jyoti agarawal et al, Nyctanthes arbortristis linn a critical ethanopharmacological review , JOURNAL OF ETHANOPHARMACOLOGY , vol 146,issue3,19 april 2013,pages 645-658..

[16]. Sowmyalakshmi venkataraman et al, Phytochemical constituents and pharmacological activities of nyctanthes arbortristis ,RJPT,vol-12, Issue 10, 2019.

[17]. Dilla José et al, Phytochemical screening, Anti microbial & Antioxidant potential of Nyctanthes arbortristis, JAIR,vol-5,Issue 2 ,July 2016.

[18]. Deepalakshmi et al , Phytochemical analysis , GC-MS characterisation & In Vitro Anti arthritic activity of Nyctanthes arbortristis leaf ,IJRAR, vol-5,Issue 4 , December 2018.

[19]. Vaishall bambal et al , Study of sunscreen activity of herbal cream containing flower extract of Nyctanthes arbortristis & Tagetes eracta L ,IJPSRR, Issue 1 , November to December 2011.

[20]. S Debnaths et al , Evaluation of Analgesic activity of Ethanolic activity , Aqueous & chloroform extract of Nyctanthes arbortristis leaves ,AJAE,vol-1, october-2022.

[21]. Anju puri et al , Immunostimulant activity of Nyctanthes arbortristis, JOURNAL OF ETHANOPHARMACOLOGY, vol-42,Issue 1, March 1994.

[22]. Jitesh S. Rathee et al, Antioxidant activity of Nyctanthes arbortristis leaf extract, FOOD CHEMISTRY,vol-103,Issue 4,2007.